## REMARKS

The application has been carefully reviewed in light of the Office Action dated November 30, 2001. Claims 60-95 have been cancelled without prejudice as non-elected claims that were subjected to restriction and election of species requirements. Claims 1 and 40 have been amended. Claims 96-121 have been newly added. Claims 1-59 and 96-121 are now pending in this case.

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The attached pages are captioned "Version with Markings to Show Changes Made."

Claims 1-59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cho (U.S. Patent No. 6,096,592) or Kamiyama (U.S. Patent No. 5,254,505) in view of Miner et al. (U.S. Patent No. 6,114,258) and Schuegraf et al. (U.S. Patent No. 5,624,865). Applicants respectfully traverse the rejection and request reconsideration.

Amended claims 1 and 40 recite "creating a mixture of hydrogen gas and oxygen gas; introducing said mixture into a chamber containing [the] substrate [and] introducing nitrous oxide gas into [the] chamber." Claim 1 further recites "contacting [a dielectric layer] with said mixture and said nitrous oxide gas so as to form an oxidation layer over said [dielectric layer]." Claim 40 further recites "contacting [a] silicon nitride layer with said mixture and said nitrous oxide gas so as to form an oxidation layer over said silicon nitride layer."

While Cho appears to disclose contacting a dielectric layer with hydrogen, oxygen and nitrous oxide gases, it does not teach or suggest that the hydrogen and oxygen be mixed and then introduced into a chamber containing the dielectric layer and wherein nitrous oxide gas is then introduced into the chamber containing the dielectric layer. Nor does Cho teach or suggest that the hydrogen and oxygen be mixed and then introduced

into a chamber containing a silicon nitride layer, wherein nitrous oxide gas is then introduced onto the chamber containing the silicon nitride layer. The methods defined by claims 1 and 40 result in a water vapor being formed by mixing hydrogen and oxygen. The nitrous oxide gas is then mixed with the mixture of hydrogen and oxygen. This method has resulted in superior results in the form of greatly reduced capacitor leakage currents, as described in the disclosure of the present invention.

Kamiyama discloses a process for forming a capacitive insulating film with a large capacitance. Kamiyama does disclose the use of oxygen, hydrogen and nitrous oxide; however, it does not teach or suggest that the hydrogen and oxygen gases be mixed separately from the nitrous oxide gas and that the mixture of hydrogen and oxygen gases be introduced into the chamber and then joined by the nitrous oxide gas.

Miner merely discloses a method of oxidizing a substrate in the presence of nitride by mixing hydrogen and one of but not both oxygen and nitrous oxide (see Miner at column 8, lines 16-26 (stating that a hydrogen-containing gas and an oxygen-containing gas can be reacted together and that the oxygen-containing gas may be oxygen gas or nitrous oxide gas)) and makes no mention of mixing hydrogen and oxygen together, separately from the nitrous oxide gas, and that the mixture of hydrogen and oxygen gases be introduced into the chamber and then joined by the nitrous oxide gas.

Schuegraf discloses a reoxidation anneal process in which one of oxygen and nitrous oxide gases can be used to obtain a desired oxygen rich environment. That is, nowhere does Schuegraf teach or suggest that oxygen, hydrogen and nitrous oxide be mixed together, much less that they be mixed together and contact the desired surface in the respective inventive manners defined by amended claims 1 and 40.

Claims 2-39 and 41-59 depend either directly or indirectly from claims 1 and 40 and are allowable for at least those reasons mentioned above and also because none of the cited references, taken alone or in combination, teach or suggest their respective inventive

combinations.

Newly added claims 96-121 each recites "contacting said second layer, during a thermal process, with hydrogen, oxygen and nitrous oxide gases so as to form an oxidation layer over said second layer." [Emphasis added.]

Both Cho and Kamiyama disclose a plasma process and not a thermal process, as defined by claims 96-121. Further, while Miner and Schuegraf respectively appear to disclose thermal processes as mentioned above, Miner does not disclose mixing hydrogen, oxygen and nitrous oxide gases together but, rather, it discloses mixing only two of these three gases together. Further, as mentioned above, Schuegraf fails to teach or suggest the mixture of hydrogen, oxygen and nitrous oxide gases as well. At least for these reasons, claims 96-121 are in immediate condition for allowance.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application (with claims 1-59 and 96-121) to issue.

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Respectfully submitted,

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**Version with Markings to Show Changes Made**

1. (Amended) A method of forming a capacitor on a substrate in a semiconductor device, comprising:

forming a first layer of a conductive material over said substrate;

forming a second layer of a dielectric over said first layer;

creating a mixture of hydrogen gas and oxygen gas;

introducing said mixture into a chamber containing said substrate;

introducing nitrous oxide gas into said chamber;

contacting said second layer with [hydrogen, oxygen] said mixture and said nitrous oxide [gases] gas so as to form an oxidation layer over said second layer; and

forming a third layer of conductive material over said second layer.

40. (Amended) A method of forming a capacitor structure in a semiconductor device, comprising:

depositing a layer of silicon nitride over a conductive layer formed over a substrate;

creating a mixture of hydrogen gas and oxygen gas;

introducing said mixture into a chamber containing said substrate;

introducing nitrous oxide gas into said chamber;

contacting said silicon nitride layer with [hydrogen, oxygen] said mixture and said nitrous oxide [gases] gas so as to form an oxidation layer over said silicon nitride layer.